REMARKS

Claims 1-3, 5-6, 8, 21-22, and 25-32 remain pending in the present Application. All of the pending claims stand rejected under one or more of Sections 102 and 103, as specifically discussed below. The following remarks address all of the issues raised in the final Office Action of January 22, 2009 (hereinafter, the "Final Action").

The two-month mark from the mailing date of the Final Action fell upon a Sunday (March 22, 2009). Accordingly, this Response is timely filed today, Monday, March 23, 2009, and Applicant is entitled to an Advisory Action. *When the day, or the last day fixed by statute or by or under this part for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or on a Federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding business day which is not a Saturday, Sunday, or a Federal holiday.*" 37 C.F.R. §1.7,

Claim Rejections under 35 U.S.C. 102 - Parker

Claims 1, 5, and 25 again stand rejected under 35 U.S.C. 102(b), as being anticipated by U.S. Patent No. 5,323,652 (hereinafter, "Parker"). Applicant again respectfully traverses the rejection of all of these claims for at least the reasons of record.

Before addressing the specific rejections, Applicant notes the following, for the record and in order to summarize recent prosecution history prior to appeal:

1. Independent claims 1 and 25 include the following features:

(a) a transparent symbol disposed on a container (e.g., a container base, in claim 25), the symbol having a water reactivity that differs from water reactivity of the container;

(b) wherein the difference in water reactivities renders said symbol visually distinct from said container when said container holds said fluid.

2. Applicant's argument that features (a) and (b) are not inherent in Parker is <u>unchallenged on the record</u>.

3. Applicant's argument regarding improper Official Notice of these features is <u>unchallenged on the record</u>.

4. The Examiner now appears to be relying on Section 2183 of the MPEP, in an attempt to establish that independent claims 1 and 25 are somehow means- (or step-) plus-function claims, product-by-process claims, or some other claim type involving functional language. It is not clear from the Office Action in what way the Examiner is attempting to define the claims. Without such clear communication of the Examiner's position, it is difficult, if not impossible, to properly respond to the Examiner's remarks.

5. Nevertheless, Section 2183 of the MPEP fails to justify the continued rejection of the present claims. Applicant does not dispute that Section 2183 allows the Examiner to ask Applicant to prove that "subject matter shown in the prior art does not possess characteristics relied upon in Applicant's claims … where the Patent Office has *reason to believe* that a functional limitation … may be an inherent characteristic of the prior art." (Emphasis added). Applicant disputes that the Examiner has not in any way established the required showing that she has any objective <u>reason to believe</u> – a prerequisite to any reliance on Section 2183 – that differing water reactivities are inherent in Parker. As with any assertion of inherency, <u>extrinsic evidence</u> is required to "make clear that the missing descriptive matter is necessarily present in the thing described in the reference." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

In the present case, however, the assertion of inherency relies solely upon a conclusory personal opinion of the Examiner, namely, that simply because materials have differing *thermochromicity*, the same materials must also have differing water reactivity. As repeatedly pointed out to the Examiner though, and unchallenged on the record, is the fact that thermochromicity and water reactivity are two entirely different phenomena, and do not necessarily bear any relation to one another. The Examiner's personal opinion to the contrary does not constitute a sufficient "reason to believe" within the clear meaning of Section 2183. As with legal determinations such as obviousness, although the Examiner is presumed to have knowledge and skill in the particular field of art, the Examiner's own knowledge and skill may not serve as the basis for finding claims unpatentable. *See e.g. In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002).

5. The Examiner argues that feature (b) of claims 1 and 25 is a functional limitation. The Examiner does not appear to argue that feature (a) of claims 1 and 25 is a

functional limitation. However, the Examiner uses the argument that feature (b) is functional in order to argue that feature (a) is taught by Parker. Again, the Examiner has not responded to Applicant's argument that feature (a) is not inherent in Parker. More importantly, the Examiner has chosen to withdraw all assertions of Official Notice as well. Accordingly, there is no evidence on the record to support any conclusion of inherency.

Turning now to the rejection of independent claims 1 and 25, the Examiner indicates that Applicant's previous arguments have been carefully considered, and notes Applicant's argument that different materials do not necessarily have different water reactivities. The Examiner also notes Applicant's argument that the Examiner improperly took Official Notice without submitting any support of such a position. The Examiner further acknowledged Applicant's argument that it is well-known that "thermochromic" relates to color changeability with heat, and not to reaction with water.

Rather than provide the required evidence to support Official Notice, or a finding of inherency, the Examiner simply attempts to shift the burden of proof by now arguing that Applicant's claims recite a functional limitation: "wherein the difference in water reactivities renders the symbol visually distinct from the container when the container holds the fluid and when a temperature of the container is reduced to a condensation point" (claims 1 and 25). The Examiner then states that a <u>separate</u> limitation ("the symbol having a water reactivity that differs from water reactivity of the container"), is deemed to be taught by Parker, since Parker uses a thermochromic and a non-thermochromic material. The problems with this rejection are at least twofold.

First, the Examiner draws from a section of the MPEP that discusses *prima facie* equivalence when a prior art element is an equivalent of a means- (or step-) plus-function limitation. See MPEP §2183. However, <u>the Examiner has not classified claims 1 and 25 as</u> means- (or step-) plus-function claims, as product-by-process claims, or any other claim type. It is difficult to properly reply to the Examiner when her intentions and interpretations are not clearly laid out.

Second, it appears that the Examiner has stated that one limitation of Applicant's claims is a functional limitation (claim element (b), above), in an effort to avoid the

Examiner's own burden of proof, required by Section 2144.03(C), to provide evidence for the Official Notice/inherency regarding <u>another</u> feature of the claims (feature (a), above). It is inappropriate to attempt to shift this burden from the Examiner to Applicant when the required showings have not first been made by the Examiner. The separate claim limitation "the symbol having a water reactivity that differs from water reactivity of the container" is not even a functional limitation, <u>nor does the Examiner attempt to argue such</u>. As the Examiner notes, a functional limitation attempts to define something by what it does, rather than by what it is. Applicant contends that water reactivity is a property of a substance, a "what it is," more than a "what it does."

Since feature (a) itself is not said to be a functional limitation (see Final Action pages 5-6), the Examiner does not have any sound basis for rejecting this feature of Applicant's claims according to even the stated rationale in the outstanding Office Action. Official Notice appears to have been withdrawn (it is no longer a reason for rejection in the Final Action). The Examiner has also failed to respond to Applicant's meritorious arguments that differing water reactivities are not inherent in Parker. Therefore, Applicant's arguments in support of this claim feature are unchallenged on the record. Applicant submits that skipping over this feature (differing water reactivities of the symbol and the container) by attempting to tie it into an argument about "functional limitations" of a separate claim feature (feature (b), above), is non-responsive at best. Therefore, <u>there is no standing rejection of a symbol and container having differing water reactivities</u>. Accordingly the Examiner has not shown that all features of claims 1 and 25 are taught by Parker, and thus the Section 102 rejection is entirely deficient on its face.

Furthermore, the Examiner's separate argument, namely, that Parker teaches a thermochromic symbol and a non-thermochromic container, is not supported by Parker. Parker discusses a thermochromic level indicator on a propane tank. <u>Parker does not discuss thermochromicity of the propane tank, at all</u>. The Examiner merely assumes, without support, that Parker's tank is non-thermochromic. Parker only states that the tank may be metallic, e.g., ferrous. It is well known that a metal heated sufficiently will turn color (e.g., red or white, or black when cooled). How, then, is Parker's tank non-thermochromic? Applicant submits that the assertion is simply without any merit. Since

thermochromicity relates to *color changeability* with heat, Parker's tank, heated sufficiently, will be thermochromic, by definition. Accordingly, contrary to the Examiner's assertions, Parker has a thermochromic "symbol" on a thermochromic tank.

The Examiner's "sound basis" for the assertion that differing water reactivities are inherent in Parker is that Parker's tank and so-called "symbol" are made of different material, "e.g., thermochromic material versus non-thermochromic material." However, as shown, both Parker's tank and "symbol" are thermochromic materials. According to the Examiner's reasoning, two thermochromic materials would *not* have differing water reactivities. The Examiner's own logic thus bars the asserted Section 102 rejection.

Finally, even though no such showing is necessary for the reasons stated above, Applicant nevertheless has provided evidence, per MPEP §2183, that Parker's propane tank and "symbol" do <u>not</u> have differing water reactivities, irrespective of the relative thermochromicity. Parker's level indicator is meant for application to a propane tank. In order to prevent corrosion, propane tanks are typically treated with a hydrophobic coating, e.g., mastic. See Appendix A. Parker's level indicator includes a transparent top film 16. Parker states that this film may be polyester (this is, in fact, the only exemplary material given for film 16):

> "The level indicator 10 preferably includes an elongate transparent film 16, such as a **polyester film**, upon which a number of layers 18, 20 of thermochromic materials are applied. A passive opaque backing layer 22 of a certain color or white is applied to the thermochromic layer 20 remote from the transparent film 16...Consequently, the line of sight of the viewer 23 would be through the transparent film 16 through the thermochromic layers 18 and 20, when in a transparent state, to the passive opaque backing layer 22." Parker col. 3, lines 10-23, emphasis added.

"[P]olyester fiber is extremely hydrophobic." Smith, et al., Appendix A. The evidence of Appendix A indicates that Parker applies a hydrophobic level indicator to a hydrophobic container. Water reactivity of the level indicator and the container are the same. Thus, the Examiner's attempt to reject claims 1 and 25 based upon functional

language that "may" be an inherent characteristic of Parker, is rebutted (again, Applicant disputes the Examiner's stated position on this issue and submits that the Examiner has not established the requisite showing to require any proof from Applicant).

In addition, and particularly with respect to claim 25, the Examiner notes Applicant's argument that Parker does not teach an open fluid receptacle. In summary, Applicant argued that Parker teaches a propane container, which is a closed container (otherwise, the liquid propane inside reverts to gaseous form). Applicant also noted that it would be highly undesireable to store propane, a flammable gas, in an open container as it could create an explosion hazard within a storage facility or building. Finally, Applicant noted that even if liquid propane could be stored in an open container, it would quickly revert to its gaseous form, unless stored at a temperature so low as to render condensation on a water-reactive symbol impossible. <u>Therefore, Parker could only be considered to suggest an open propane container for temperatures that could not read upon the condensation point features of claim 25</u> either.

The Examiner has responded to these meritorious arguments by asserting that Parker's propane tank has to be opened to release the propane "and is thus an open fluid receptacle in use." Final Action, page 7, fourth paragraph. Respectfully, this argument has no merit either. Even when in use, a propane container cannot be "open" in the manner of Applicant's open fluid receptacle, as asserted by the Examiner. Propane tanks are not open in the manner of a glass or bottle, for example. When in use, propane tanks typically feed into tubing or gas lines that lead to an appliance or device that burns the propane, which, as easily understood by a person of ordinary skill, is a closed system (very different too, for example, from a mug). See Specification paragraphs [0043]-[0046]. Furthermore, as also unchallenged on the record, Parker teaches against an open fluid receptacle by citing desireability of measuring volume/level of a material in a tank *without opening the tank*. See Parker col. 1, lines 13-15.

<u>*Dependent Claim 5*</u>: Claim 5 depends from claim 1 and benefits from like argument. Accordingly, the rejection of claim 5 should also be withdrawn.

<u>Claim Rejections under 35 U.S.C. 102 - Arora</u>

Claims 1-3 and 5-6 again stand rejected under 35 U.S.C. 102(b), as being anticipated by U.S. Patent No. 7,048,971 (hereinafter, "Arora"). Applicant respectfully repeats the traversal of this rejection as well, for at least the reasons of record, those discussed above, and as follows. Arora fails to teach (or suggest) that a difference in water reactivities <u>between the symbol and the container</u> renders the symbol visually distinct, and <u>when the container holds a fluid</u>.

Arora discloses a two-part symbol 10, with one part being hydrophilic, and the other being hydrophobic. (See FIGS. 1-2). The two-part symbol 10 can be attached to a substrate, which can be an LCD (see col. 12, lines 39-57), but Arora never discusses a specific relationship between water reactivities of the symbol and the LCD. In fact, Arora clearly teaches that it is only the difference between water reactivities of the separate parts of the symbol itself that renders the symbol visible, and not a difference with the container. An LCD screen will contain fluid typically, but the presence of the fluid in the LCD will have no effect on the visibility of Arora's symbol.

In response to the above argument, the Examiner notes Arora's disclosure that "stimuli also includes a change in temperature including condensation of water vapor from air on the hydrophilic coating" Col. 4, lines 23-26, Final Action p. 7, final paragraph. Respectfully, regardless of the merits of this assertion, the assertion has nothing to do with a <u>difference in water reactivities between the symbol and the LCD</u> (which the Examiner likens to a container). Arora simply does not teach differing water reactivities (symbol vs. container) that render a symbol visually distinct when the container holds a fluid.

In contrast, independent claim 1 of the present Application, as last amended, features that the difference in water reactivities <u>between the symbol and the container</u> is what renders the symbol visually distinct, and <u>when the container holds the fluid</u>. Arora does not teach or suggest these features. The visibility of Arora's symbol is self-contained by its two-part structure. The water reactivity of the LCD will have no effect on its visibility, nor will the presence of the liquid crystal that may be contained within the LCD device. It is important to note that Arora never actually shows a container in a

single drawing. It must further be noted that an LCD *without* fluid is, by definition, an unworkable device. There could be no purpose for placing an indicator on an LCD to show whether the LCD contained fluid. Accordingly, Arora cannot teach (or suggest) that its symbol's visibility is dependent on either of the water reactivity relationship with the container, or the fluid being present in the container, both of which are clearly featured in independent claim 1 of the present Application.

Claims 2-3 and 5-6 all depend from independent claim 1, and therefore contain all of the features of the base claim, plus additional features. Accordingly, the rejection of these dependent claims is respectfully traversed for at least the reasons discussed above in traversing the rejection of independent claim 1 based solely upon Arora.

Claim Rejections under 35 U.S.C. 103

Claims 8, 21-22, and 25-32 stand rejected under 35 U.S.C. 103(a), as being unpatentable over Arora in view of U.S. Patent No. 4,032,687 (hereinafter, "Hornsby") and Parker. Applicant respectfully maintains traversal of this obviousness rejection for at least the reasons of record, those discussed above, and as follows.

Claims 8 and 21-22: With respect to claims 8 and 21-22, Applicants traverse the rejection for at least the reasons discussed above. Each of these claims depends directly or indirectly from claim 1, and therefore the base rejection that relies on Arora is still deficient with respect to these claims. The mere citation to Hornsby and Parker – without indicating what portions of these references are allegedly relevant to the present claims – fails to resolve the clear deficiencies in the base reference. Contrary to the Examiner's note at page 8, the Final Action does not address or in any way resolve the deficiencies in the base references. See above arguments.

With further respect to claim 8, none of the three references teaches or suggests a symbol embedded in the surface of the container. The American Heritage Dictionary of the English Language (Fourth Ed. 2000), defines the term "embed" as meaning:

(1) To fix firmly in a surrounding mass: embed a post in concrete; fossils embedded in shale. (2) To enclose snugly or firmly. (3) To cause to be an integral part of a surrounding whole.

None of Arora, Hornsby, or Parker show any symbol embedded in a container surface. As unambiguously shown in FIGS. 1-2 of Arora, FIGS. 1-5 of Hornsby, and FIGS. 1 and 5-8 of Parker, <u>not a single indicator/symbol is shown to be embedded in any surface of any container</u>. Arora and Hornsby both show nothing other than stick-on labels or films that will always be over – and not in – the surface of the respective substrate (Arora, not shown or numbered) or cup 12 (Hornsby). Parker additionally discloses magnetic indicators, but also only on top of – never in – the surface of the tank 12.

The Examiner responds to these arguments by stating that "it would have been obvious ... to use Arora's symbol of [*sic.*] different types of containers, i.e. the symbol is embedded in a surface of the container, the container comprising an open fluid receptacle formed of a base disposed upon a substrate and a wall affixed to and extending upwardly from said base, container comprising a confined passageway, etc, that need easy visible references to the temperature of the container." Final Action p. 8, final paragraph. The Examiner then cites a section of the MPEP that deals with combining compositions, and then argues that type of container is a matter of design choice.

Applicant strongly disputes these assertions for several reasons. First, the Examiner has not provided adequate basis for the conclusory personal opinion that it would be obvious to modify Arora to include multiple features of Applicant's claims (claim 6 in particular) that are nowhere suggested in Arora, Hornsby, or Parker. As codified in Section 2143.01, *prima facie* obviousness cannot be established by merely picking and choosing unrelated features from various references. Instead, the Examiner has the burden to additionally indicate in the written record where *the prior art itself* teaches or suggests the motivation to combine the references as proposed, absent any evidence in the record of some well-known principle in the art. The final Office Action entirely fails to provide any <u>objective, factual evidence</u> supporting the asserted motivation to combine the references.

The final Office Action merely implies that, because Hornsby and Parker disclose different types of containers with color-changing appliqués, it would have been obvious to use Arora's symbol with different types of containers. However, none of the references themselves make this suggestion, and the record does not indicate where the proposed rationale is well-known in the art. Without any teaching or suggestion by the references in support of the proposed modification, and without any other form of supporting factual evidence, this stated rationale amounts to nothing more than a conclusory personal opinion, by definition. Mere conclusory statements, however, without any actual evidence cited on the record in support thereof – the required "rational underpinning" – cannot satisfy the burden to establish the obviousness of combining the references. *In re Lee,* 277 F.3d 1338 (Fed. Cir. 2002); *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). "Rejections on obvious grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*. Accordingly, the rejection should be withdrawn for these additional reasons.

Second, to make Arora's symbol an *embedded* symbol would necessarily change Arora's principle of operation. Arora's symbol is meant to be stuck to the <u>surface</u> of a substrate, e.g., an LCD. Embedding Arora's symbol *in* the LCD, on the other hand, would make that portion of the LCD unreadable, at a minimum, since anything embedded within an LCD would displace liquid crystal material from that area of the screen. More likely though, any attempt to embed such a symbol in the thin, fragile substrate of an LCD screen would likely fracture the screen and cause the liquid crystal inside to leak out, thereby rendering the device inoperable for these additional reasons.

For at least these reasons, the rejection of claim 8 is deficient on its face and must be withdrawn.

With respect to claim 21, none of the three references show <u>a confined passageway disposed within a surface of the container</u>, as featured in the claim. Similar to the deficiencies in the rejection of claim 8, not one of the three references teaches or suggests any features within the surface of a container. Hornsby shows a cup 12, but

never shows or describes anything embedded or disposed within the surface of the cup 12. Parker shows a tank 12, but equally fails to show or describe anything – embedded or disposed – within the surface of the tank 12. The Examiner has not even asserted that anything can be embedded in the thin, fragile surface of an LCD screen, such as that briefly mentioned by Arora. Applicant remains at a loss to understand the Examiner's reliance on any of these references with respect to these claims.

The Final Action again fails to assert what features of the references allegedly read upon these features of claim 21 (and 8), instead now merely asserting that these features would have been obvious, simply because Hornsby and Parker disclose different types of containers. This assertion is also nothing more than the personal opinion of the Examiner. There is no evidence on record to support these assertions, nor do the references themselves suggest these modifications as proposed by the Examiner. By definition, the Examiner's personal opinion can never satisfy the definition of "documentary evidence, capable of objective review and rebuttal." The Examiner, for example, has not submitted anywhere in the record how she arrived at her conclusory opinion, where she received the knowledge that forms the basis of that opinion, nor the actual dates such knowledge was obtained by her. The present case therefore presents the exact situation expressly rejected by the Federal Circuit in *Lee*. The rejection should again be withdrawn for at least this reason.

With respect to claim 22, the rejection is even further deficient. Claim 22 depends from claim 21, and therefore is patentable for at least the same reasons that apply to claim 21 (as well as claim 1). The rejection is further deficient for failing to even assert where any one of the references teaches or suggests that the alleged passageway in the surface of the container additionally is configured for holding a coolant. Again, not one of the references shows or describes anything similar, and the rejection makes no effort to indicate where such features could exist in the cited art. The Examiner has previously reviewed these exact arguments, but avoids answering them by asserting that, since Hornsby and Parker disclose different types of containers, it would have been obvious to use Arora's symbol on different containers. However, a passageway configured for holding coolant is not even asserted. The Examiner merely provides a

blanket list of Applicant's claim features (excluding the coolant-holding passageway), and ends with "etc." Presumably, this "etc." is meant to encompass the features of claim 22. However, as with the other rejections, there is absolutely no support in Hornsby, Arora or Parker for the proposed modification, and the Examiner provides no objective evidence in support of her position. Thus, the rejection of claim 22 must also be withdrawn.

Claims 25-32: With respect to independent claim 25, the rejection is deficient for at least the reasons discussed above with respect to the rejection of claim 1 based only upon Arora. Claim 25 similarly features a relationship between the water reactivities of the symbol and the container (unlike Arora), and neither Hornsby nor Parker teach or suggest anything about water reactivities. Accordingly neither Hornsby nor Parker could modify Arora to make up for this significant deficiency in the base references.

Claim 25 additionally features that the container is open, and therefore neither of Hornsby and Parker *could* be combined with Arora to reach the present invention with respect to claim 25. As discussed above, Parker does not show an open container. The reference has been clearly misread in this regard. Hornsby shows an open cup 12, but the rejection fails to even assert that Hornsby's cup 12 *could* somehow be adapted to the LCD cited from Arora, let alone that there is any teaching or suggestion in either reference that one of ordinary skill would be motivated to do so.

Furthermore, as easily understood in the art, an LCD cannot operate as an open container, without ruining the "container" for its intended use. Moreover, the rejection fails to provide any line of technical reasoning for how a paper cup (Hornsby) could be structurally adapted to modify the LCD device cited in Arora. Hornsby's appliqué 10 – similar to Parker – is nothing but a temperature indicator. It has nothing to do with water reactivity, and its application to the cited LCD from Arora would do nothing more than indicate a temperature threshold for the LCD. The combination would not, for example, indicate the presence of the liquid crystal fluid in the LCD.

It should also be noted that claim 25 further features that the symbol is disposed on a base facing a substrate, from which extends a wall that forms the container. Hornsby and Parker are therefore both excluded from a rejection of claim 25 because

both references affix the temperature indicator to only a *wall* of the respective container, and not a base. Neither reference could be modified to move the respective symbol to the base, because either reference would therefore be ruined for its intended purpose. Both references are meant to have the temperature seen from the wall side of the container.

The rejection is therefore further deficient on its face according to Section 2143.01 of the MPEP. Section 2143.01 requires that, absent objective evidence on the record of some well-known principle in the art, the references themselves must provide a teaching or suggestion to make the proposed combination. In the present case, however, no evidence of any well-known art principle has been submitted to the record, nor has any teaching or suggestion from the references themselves been cited in support of the proposed combination of all three references. Without such evidence on the record, the proposed combination is itself conclusory only, and thus demonstrates a clear case of impermissible hindsight. Accordingly, the Section 103 rejection is further deficient on its face, and must be withdrawn for these reasons as well.

Moreover, even could some motivation have been place in evidence to support the proposed combination (which Applicant does not concede), the rejection would still have to be withdrawn on rebuttal, since no combination of the three references could achieve the unchallenged advantages of the present claims. With respect to claim 25, for example, none of the references, alone or in combination, could indicate whether an open container still contained fluid. Parker and Hornsby could not show anything more than a temperature of the container, whether or not the container contained a fluid. Arora fails to show how any parameter of the container could be indicated. Arora's purpose is merely to show its symbol briefly in response to outer stimuli. The contents of the LCD, or any other container, are irrelevant to Arora's two-part symbol. In the only example cited, Arora's symbol would appear (or not) regardless of whether there was any fluid in the LCD device. Accordingly, the novel, useful, and unchallenged advantages of the present claims would still overcome the *prima facie* Section 103 rejection of record, even could it have been properly established.

With respect to claims 26-32, these claims each depend directly or indirectly from claim 25, and are therefore allowable for at least the same reasons. With respect to claims 30-32 specifically, Applicant further traverses as follows.

With respect to claim 30, none of the references, whether taken alone or in combination, teaches or suggests <u>a plurality of base extensions elevating the substrate from the base</u>, nor that <u>one or more of the base extensions form the symbol</u>. Applicant is frankly at a loss to understand what portions of these references the rejection could have meant to refer to in its summary rejection. Not one of the references shows any extension from a base, let alone an extension forming the symbol. As discussed above, the indicators from Hornsby and Parker are both attached to a wall of a container, and not the base. Arora simply remains silent about containers as a whole. The rejection of claim 30 therefore, is entirely without merit, and must be withdrawn.

The rejection of claims 31 and 32 are thus also entirely without merit for similar reasons. As discussed above with respect to claims 21 and 22 respectively, none of the three references, whether taken alone or in combination, teach or suggest anything related to a <u>confined passageway disposed within one or both of the base and the wall</u> (claim 31) or that the passageway is <u>configured for holding a coolant</u> (claim 32). Nothing remotely similar to either of these features appear in any of the references, and the rejection of these claims in particular is entirely without merit. The rejection of claims 31-32 must also be withdrawn.

Applicant previously presented all of the foregoing arguments in support of claims 25-32, and traversing the asserted rejections of these claims. However, not one of these meritorious arguments appears to have been given reasonable consideration. The Examiner fails to challenge a single one of these arguments on the merits, and instead merely repeates the irrelevant and unsupported rationale that, since Hornsby and Parker teach different containers, Arora's logo can be applied to whatever container is disclosed in Applicant's claims.

Since the Examiner has not responded to each of Applicant's arguments, Applicant strongly asserts that finality of the instant office action is improper: "The examiner should never lose sight of the fact that in every case the applicant is entitled to a

full and fair hearing, and that a clear issue between applicant and examiner should be developed, if possible, before appeal." MPEP §706.07, emphasis added. The Examiner's unsupported blanket statements (see Final Action page 4, first two paragraphs) does not allow for the development of clear issues.

Finality of the January 22, 2009 Office Action is therefore improper. Applicant respectfully requests withdrawal of the finality of this office action. If a Notice of Allowance is not forthcoming, Applicant further requests issuance of a new, non-final office action in order to provide the full and fair hearing, to which Applicant is entitled.

CONCLUSION

Applicant submits that the above remarks address all issues raised in the Final Action of January 22, 2009. Applicant accordingly solicits a Notice of Allowance for all pending claims. If a Notice of Allowance is not forthcoming, Applicant again submits that finality of the instant office action is improper, and requests a new, non-final action so that clear issues may be developed, at least regarding the rejection of claims 26-32.

The two-month mark from the mailing date of the Final Action fell upon a Sunday (March 22, 2009). Accordingly, this Response is timely filed today, Monday, March 23, 2009, and Applicant is entitled to an Advisory Action. See 37 C.F.R. §1.7,

No fees are believed due. However, should any fee be deemed necessary in connection with this Response, the Commissioner is authorized to please charge any such fees to Deposit Account No. 12-0600.

Should any issues remain outstanding, the Examiner is again invited to contact the undersigned attorney.

Respectfully submitted,

LATHROP & GAGE LLP

Date March 23, 2009

By [signature]

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APPENDIX A

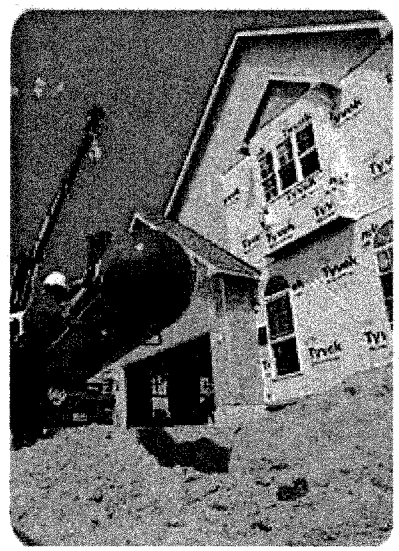
To the Response to final Office Action of 01/22/2009

Application Serial No. 10/696,373

About Propane Appliances

Tanks ---- Select Product ---- GO

UNDERGROUND TANKS



You already know the benefits of gas energy.

It's clean, safe, economical, and reliable. It can fuel the furnace, water heater, cook-top, clothes dryer, and many other appliances in the home. With tank burial and landscaping designs able to keep propane tanks out of sight, more and more homeowners across the nation are turning to propane to bring the warmth of gas energy to their homes.

Out of Sight, Out of Mind

Propane can fuel a home discreetly, almost invisibly, from underground tanks. Once a propane tank is buried, only a small dome is visible – mere inches above the ground. The dome houses valves, gauges, and regulators, allowing for easy servicing and refilling. Even large-capacity tanks can be installed with minimal visual intrusion, yet still providing the clean, efficient comfort of propane energy.

The Tank

Propane tanks are constructed of heavy steel and are specially painted with a mastic coating to prevent corrosion. Environmentally friendly and requiring no maintenance, a propane tank will typically last for 30 to 40 years. Single-family homes can be fueled by tanks of varying sizes, depending on the demand. Smaller 100-gallon tanks provide energy for appliances, while 1,000+ gallon tanks can fuel very large homes with swimming pools and hot tubs. Generally, 500-gallon tanks easily accommodate an average four-bedroom home.

Excavation

Excavation is usually small – approximately four feet wide by twelve feet long by five feet deep. Because of the smaller dimensions, excavation costs are minimal.

Your Propane Retailer Can Help

Propane retailers are professional gas installation specialists. They can work with you on a project – from start to finish – to ensure the best possible energy system for your home. Generally, they will install the tank and make all gas hook-ups to the house. Your local propane retailer can assist you with:

- Site advice
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- Full installation support

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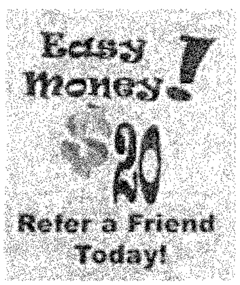

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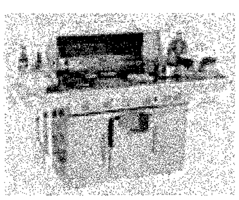

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Monday March 23rd 2009

PROPANE TANK

You already know the benefits of propane. It's clean, safe, economical, and reliable. It can fuel the furnace, water heater, cook-top, clothes dryer, and many other appliances in the home. With a buried tank and landscaping designs able to keep propane tanks out of sight, more and more homeowners across the nation are turning to propane to bring the warmth of gas energy to their homes.

Propane can fuel a home discreetly, almost invisibly, from underground tanks. Once a propane tank is buried, only a small dome is visible – mere inches above the ground. The dome houses valves, gauges, and regulators, allowing for easy servicing and refilling. Even large-capacity tanks can be installed with minimal visual intrusion, while still providing the clean, efficient comfort of propane energy.

The Tank

Propane tanks are constructed of heavy steel and are specially painted with a mastic coating to prevent corrosion. Environmentally friendly and requiring no maintenance, a propane tank will typically last for 30 to 40 years. Single-family homes can be fueled by tanks of varying sizes, depending on the demand. Smaller 100-gallon tanks provide energy for appliances, while 1,000+-gallon tanks can fuel very large homes with heat for the house, swimming pools and hot tubs. Generally, 500-gallon tanks easily accommodate an average four-bedroom home.

Excavation

Excavation is usually small – approximately four feet wide by 12 feet long by five feet deep. Because of the smaller dimensions, excavation costs are minimal.

Paraco Gas has professional gas installation specialists. We can work with you on a project – from start to

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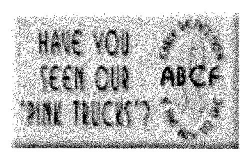
PROPANE EXCEPTIONAL ENERGY

TOP 50

Paraco Gas ranked No. 14 in nation's top 50 propane retailers in 2008.



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Construction Products Division

ELASTUFF 120 MASTIC

100% SOLIDS POLYURETHANE MASTIC
Classified by Underwriters Laboratories Inc.
in Accordance with ANSI/NSF Standard 61

Technical Data & Application Instructions

PRODUCT DESCRIPTION

ELASTUFF 120 MASTIC is a two-component, 100% solids polyurethane elastomer in a high-build, mastic consistency. This system provides a limited workable pot life, and therefore does not require specialized application equipment. **ELASTUFF 120 MASTIC** can be applied by trowel or can be thinned slightly to create a brush/roller-grade version for use on vertical and horizontal applications requiring either heavy or light film builds. **ELASTUFF 120 MASTIC** is a highly crosslinked polymer coating, which yields a dense, slick finish. The non-porous nature and excellent hydrolytic stability, coupled with resistance to cathodic disbondment, make **ELASTUFF 120 MASTIC** an excellent barrier to moisture and corrosion.

Designed to protect surfaces subjected to abrasion in aqueous solutions or environments, **ELASTUFF 120 MASTIC** can be used in potable water systems, salt water, various slurry systems, and numerous acid and base solutions.

The high tensile strength of **ELASTUFF 120 MASTIC** contributes to its resistance to abrasion and tearing. This toughness, combined with its high elongation properties, results in outstanding flexibility and impact resistance.

BASIC USES

ELASTUFF 120 MASTIC is used as a sealant, caulk, filler, bonding agent and finish where hydrophobic, abrasion and chemical resistance properties are required. It is used over sealed concrete and primed metal surfaces, and also has excellent adhesion to high density polyethylene (HDPE) products when applied in conjunction with a heat treated surface. Typical applications utilizing **ELASTUFF 120 MASTIC** include interior tank lining, waste/water containment, manhole repairs, flumes, reservoirs, valves, interior pipe, and other areas subjected to aqueous environments.

ELASTUFF 120 MASTIC is a non-toxic lining and can also be used in applications associated with potable water containment. It has been tested and classified by UL in accordance with ANSI/NSF 61, Section 5, Barrier Materials. Any primers or topcoats use in potable water applications should also be certified.

TYPICAL PROPERTIES

1. **Mixing Ratio:**
   1 part A to 1 Part B by volume (1A:1B)
2. **Flash Point:**
   Part A > 200°F (93°C)
   Part B > 200°F (93°C)
3. **Dry Time to Touch:**
   4 hours tack free @ 75°F (24°C), 50% R.H.
4. **Cure Time:**
   90% after 24 hours @ 75°F (24°C), 50% R.H.
5. **Mixed Usable Pot Life:**
   20 minutes @ 75°F (24°C), 50% R.H.
6. **Water Absorption:**
   Less than 1% weight gain after 7 days [ASTM D570]
7. **Tensile Strength:**
   1,300 psi (±100) (9.0 MPa) [ASTM D412]
8. **Elongation:**
   150% (±20) [ASTM D412]
9. **Tear Strength:**
   200 lb/in. (±30) (35 kN/m) [ASTM D1004]
10. **Hardness:**
    30 to 40 Shore D @ 75°F (24°C)
    40 to 50 Shore D @ 35°F (2°C)
    [ASTM D2240]
11. **Abrasion Resistance:**
    20 to 30 mg weight loss with CS-17 wheel;
    50 to 70 mg weights loss with H-10 wheel using 1000 gm weight at 1000 revolutions
    [ASTM D4060]
12. **Low Temperature Flexibility:**
    Passes ¼" (6 mm) mandrel bend @ -4°F (-20°C)
13. **Low Temperature Impact Resistance:**
    Passes 160 inch pound (18.1 Joules) direct @ -4°F (-20°C)

COLORS

Standard color for **ELASTUFF 120 MASTIC** is Gray. For custom colors, consult UNITED'S Technical Service Department.

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Technical Data & Application Instructions

Fashion Applications for Polyester Fiber, Particularly Hydrophilic Polyester

By Florence Smith, TS&D Europe,
and Dr W.P. Mei, Associate TS&D Specialist
~~Dow Corning Corporation~~

Overview

Despite the fact that polyester fiber is extremely hydrophobic, it has a bright future, particularly in the fashion industry, as consumers increasingly are attracted by its easy-care properties. While research continues to develop an ideal hydrophilic polyester solution, this article examines ways to increase the hydrophilicity of polyester via processing routes (such as denier reduction and microfibers) and chemical routes (topical finishes).

Introduction

Polyester is a manufactured fiber in which the fiber-forming substance is any long-chain, synthetic polymer composed of at least 85% of an ester of a substituted aromatic carboxylic acid. This can include, but is not restricted to, substituted terephtalic units, p(-R-O-CO-C_6H_4CO-O-)$_x$ and parasubstituted hydroxy-benzoate units, $_p$(-R-O-CO-C_6H_4-O-)$_x$. [12]

Polyester is manufactured by reacting ethylene glycol with either terephtalic acid or its methyl ester in the presence of an antimony catalyst. The reaction is carried out in an autoclave at high temperature (ca 300ºC) for five to eight hours. Then, it placed under a hard vacuum to achieve the high molecular weights required to form useful fibers. Following that, polyester is melt-spun, which involves melting the polymer chips for extrusion through the spinneret and then directly solidifying them by cooling. The filaments are drawn and stretched by about 400% in order to achieve the required characteristics. [12, 13]

History of polyester

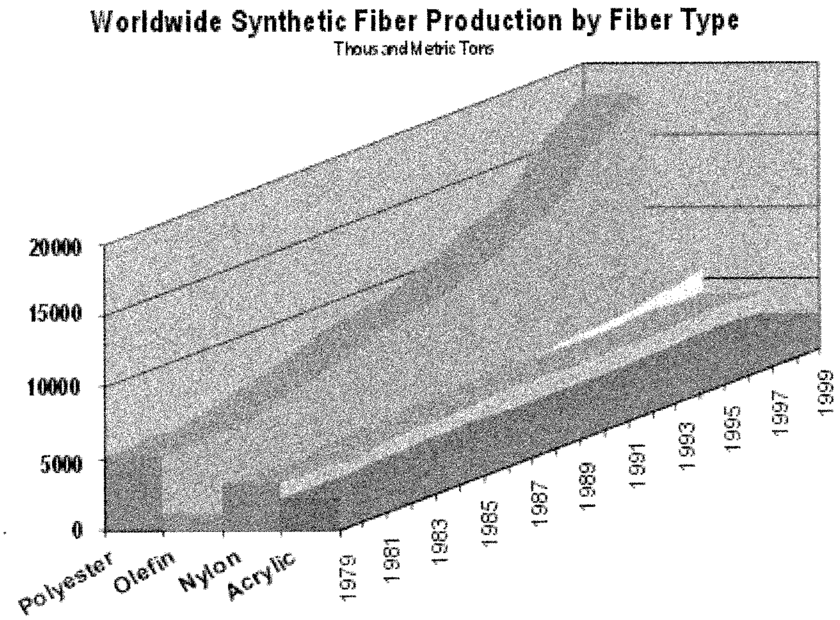
The work of Wallace Carothers in the late 1920s laid the foundation for all processes used in the production of filaments such as polyester. In the late 1940s, Calico Printers Association in Great Britain picked up on Carothers' work and they were the first to produce polyester. DuPont subsequently acquired the polyester filament production patent rights for the United States and ICI acquired the patent rights for the rest of the world.

Polyester was commercialized in the 1950s transforming the "wash and wear" novelty into a revolution in textile product performance. As polyester garments emerged from the dryer wrinkle-free, consumers increasingly bought more garments made from polyester.

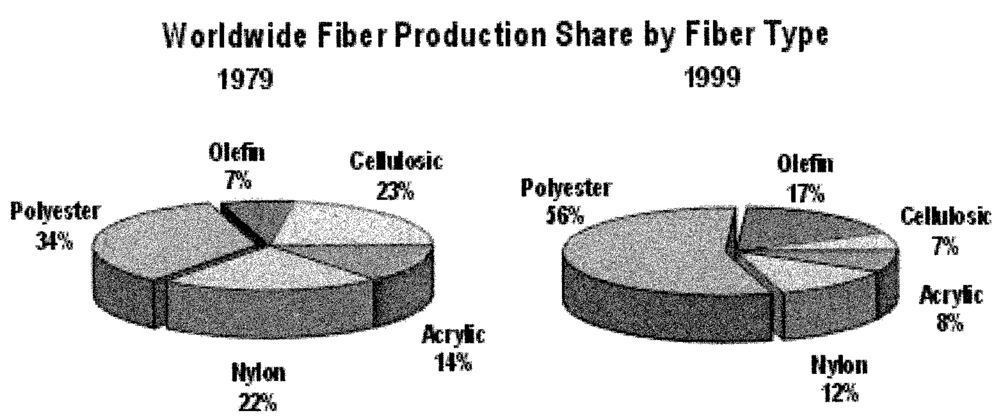
Fabrics became more durable, color became more permanent, and shape-retaining knits offered new dimensions in comfort.

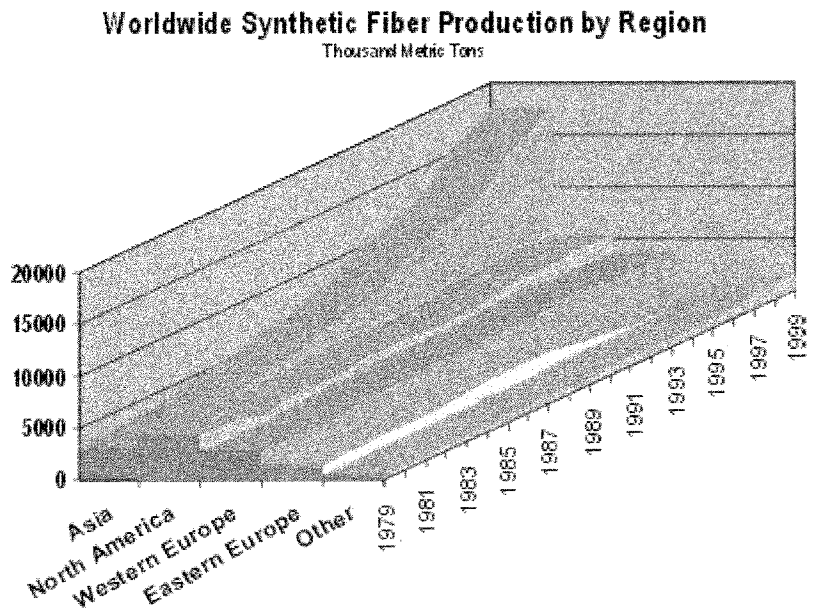
Polyester: The synthetic fiber of choice

According to recent statistics,[12] polyester is rapidly becoming the synthetic fiber of choice with a strong, long-term growth outlook In 1999, statistics show that out of 34.2 million metric tons of synthetic fibers manufactured, 17.9 million metric tons of that amount included manufactured polyester fibers.



In the global synthetic fiber production market, polyester production shares have increased from 34% in 1979 to 56% in 1999. This growth has resulted in a major shift in production from North America and Europe to Asia. In 1999, Asian production was 17.7 million metric tons compared with 5.5 million metric tons in North America and 3.9 million metric tons in Europe.





The need for hydrophilic polyester

Polyester has become very successful within the fashion industry due to its chemical resistance, its wrinkle resistance and its quick-drying properties. However, polyester only has a moisture regain of 0.4% (measured at 20ºC and 65% relative humidity) when compared to cotton, which has a moisture regain of ca 7%. This low moisture regain means polyester is extremely hydrophobic. The hydrophobic nature of polyester results in a relatively low level of comfort, as moisture is not absorbed nor drawn away from the skin. This has restricted the use of polyester in such textile applications as sportswear, underwear and bedding. Additionally, due to the hydrophobic nature of polyester, the fabric will exhibit static problems such as cling during wear and difficulty in cutting and sewing.

Creating a hydrophilic polyester to meet market needs has been explored via chemical routes and processing routes. Chemical routes include using a topical finish and processing routes involve using denier reduction and microfibers. Fabric construction can also influence the hydrophilic properties due to mechanisms of moisture transport between fabrics. Moisture can remain in the fiber cross-sections, on the surface of the fibers, in the voids formed within a yarn by a plurality of fiber channels and in the voids caused by yarn crossovers in woven and knitted fabrics. While vapor transfer depends on air permeability independent of fiber type, capillary wicking of liquid water exhibits a high dependency on the hydrophilic degree of the fibers. A minimum moisture regain of 4% is required to activate the wicking mechanism.[4]

While the high-tech outdoor apparel market is eager to obtain and pay for fiber innovation, the more traditional textile industry is reluctant to add cost to an already

competitive market. Most textile applications will not require durable hydrophilic properties, as initial "off the shelf" performance is more important. However, sportswear applications require a five-wash minimum durability. This wash durability requirement will also influence the cost structure. However, it should be noted that due to poor rinsing, successive launderings will leave some residual rewetting surfactants or will erode the surface of the polyester.

Processing route: Denier reduction and microfiber

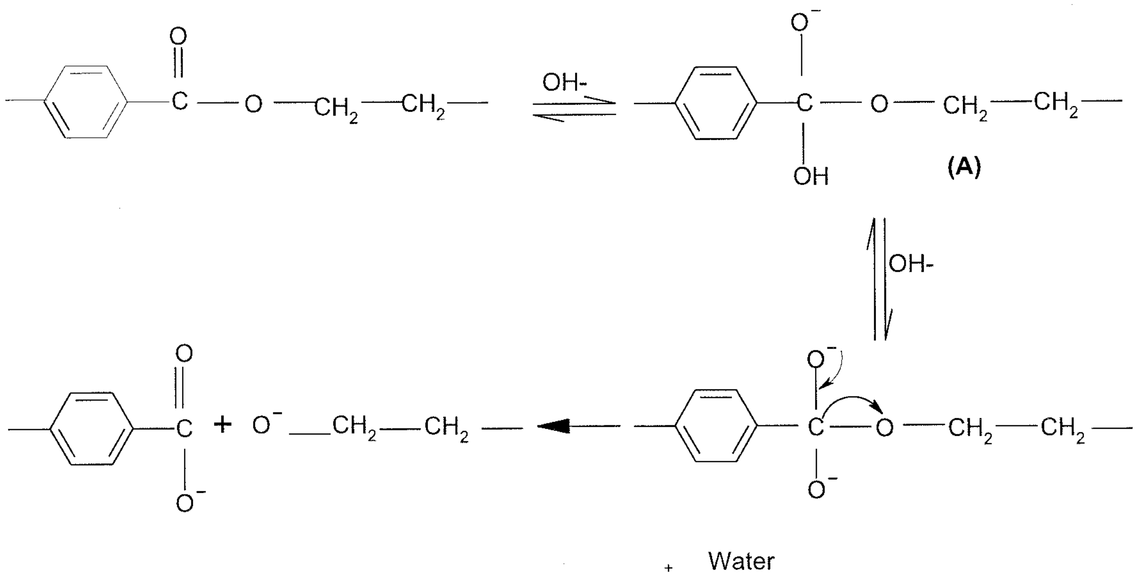
There are ways to increase the hydrophilicity of polyester via processing routes such as denier reduction and microfibers.

Conventional fibers are in the range of 1.5 to 4 deniers per filament (dpf). (For example, cotton contains 1.5 dpf; polyester, contains 2 dpf.) Microfibers are in the range of 0.5 dpf (minimum below 1 dpf) and are manufactured like standard fibers, via extrusion. Microfibers contain up to four times as many filaments as conventional fibers and therefore have more surface area.[8] To illustrate, a woven cloth with a 1 dpf per warp and 0.55 dpf per weft, will have an absorbency of 8 seconds. This considerably improves the hydrophilicity compared with standard fibers and the hand of microfibers is similar to the hand of silk.

Denier reduction is actually an alkalization of the polyester and a surface phenomenon by which shorter chains from the fiber surface are hydrolyzed.[2] It is suggested the number of hydrophilic groups on the fiber surface is increased due to the chain scission.[5]

Denier reduction involves weight loss that varies depending on the initial thickness of the fabric and the bath conditions. Denier reduction of 5% to 15% usually is required in order to achieve noticeable hydrophilicity.

The polyester alkalization mechanism is as follows:[2]



The chemistry, based on the nucleophilic attack of a base on the electron-deficient carbonyl carbon along the polymer chain, causes scissions at the ester linkages and produces carboxyl and hydroxyl polar groups. The increased surface polarity enables polar interaction of hydrogen bonding with water molecules, thus increasing the water wettability of the fibers.

It is the removal of water that drives the reaction to completion. The intermediate anion (A) is negatively charged and due to the electrostatic repulsion, between the negative fixed ions on the polyester and the mobile hydroxyl ions, the further attack by the base will be retarded

The reaction can be processed using three mechanisms: 1) in a solvent at room temperature; 2) in water at high temperature; and 3) in water at high temperature with a cationic catalyst.

When processing via a solvent mechanism, solvents typically used are methanol or ethanol. When methanol is used as the solvent, optimum conditions for the reaction are 5% sodium hydroxide in 20% methanol at 60°C for 60 minutes. This gives a weight loss of 5%.[1] When ethanol is the solvent of choice, it has been observed that the rubbing fastness of pigments is increased.[7] The concentration of sodium hydroxide required will decrease with the increasing temperature.

Quaternary ammonium salts are usually used as the cationic catalyst when the reaction occurs in water at high temperatures.[6] The positively charged quaternary ammonium ions shield the negatively charged free group in the polyester, therefore facilitating further attack by hydroxyl ions. Because there is a lag time before the activity is appreciable, it is

likely that the OH ions are absorbed first by the fiber and that the attachment of the positively charged cationic ions is lower due to their bulky nature.[7]

When working at high temperatures, it is best to raise the temperature very gradually, at a rate of 1° to 2°C per minute, in order to avoid the appearance of cracks.

Utilizing a processing route to increase polyester hydrophilicity can be accomplished by using a batch process, a semi-continuous process or a continuous process.

A batch process involves utilizing equipment such as jigs, winch beck jets or overflow systems. The duration of the reaction can be calculated on the basis of the denier, caustic soda concentration, bath ratio and temperature. However, the calculation can be imprecise as it also is necessary to take into account not only the fiber type but the heat treatment history as well. Generally, an increase in weight loss is proportional to the concentration of sodium hydroxide.

In a semi-continuous process, the fabric is impregnated with caustic soda at a relatively high temperature prior to rinsing. There are two types of semi-continuous processes – pad batch process and pad roll process. The pad batch process entails the fabric being padded with 20-30% sodium hydroxide and then left to age for 12 to 24 hours at a temperature between 25° and 60°C. Utilizing the pad roll process, the fabric is padded with 10-20g/L of sodium hydroxide and left to age at 100°C in a microwave steam chamber.

A continuous process involves impregnating the fabric with caustic soda and then leaving it in either saturated or super heated steam at 105°-110°C. Debaca™ is one such continuous process developed by Montefibre and Sperotto SPA.[6] In a continuous process, weight loss also increases with alkali concentration, but eventually will reach a plateau.

Denier reduction is used widely, but it is difficult to accurately control the weight loss. Typical levels are 15-30% weight loss. The main reason for not achieving higher levels of weight loss is due to the decrease in the mechanical properties of the polyester fibers. Some research reports a loss of 20% in fiber strength and elongation.[2]

Research is being undertaken on new ways to achieve denier reduction without impacting the mechanical properties of the polyester fibers. One study reports the use of lipase[10] as a more environmentally compatible process because enzymes, generated from renewable resources, are biodegradable. Another paper reports a co-polymerization of acrylamide and diallyldimethyl ammonium chloride on the surface of the polyester.[11]

Chemical route: Topical finish

Another way of increasing the hydrophilicity of polyester is via a topical finish or chemical route. This implies the use of chemicals applied via padding. Fluorinated derivatives[4] are used widely as they exhibit anti-static and soil-release properties, therefore combining several "easy care" properties.

Another chemical route concept is to use a two-part molecule.[3] One part of the molecule will go into the polyester structure like a disperse dye and will confer durability. The other molecular part will be a highly hydrophilic chain. Typical technologies are silicone polyethers and organic quats.

Although topical finishes will confer instant wetting, they generally lack durability and softness.

Summary

Polyester is a growing fiber for textile applications, particularly in the fashion industry. The future of polyester appears bright as more and more consumers are attracted by its easy care properties. While the use of polyester is still restricted in some applications because of its low moisture regain, this is being addressed via denier reduction or topical finishes.

An ideal hydrophilic polyester solution has not yet been developed. Denier reduction can generate a substantial amount of waste, perhaps up to 30% polyester in effluent, and it lowers the mechanical properties of polyester. Microfibers are attractive as they combine properties such as hydrophilicity and a silk-like hand, however their applications are restricted to lightweight garments such as blouses. Topical finishes offer instant wetting but generally lack in durability and softness, and therefore require the use of additional softener. Lastly, solution costs also need to be considered. Although a cost can be offset by high-tech applications, traditional segments like fashion are more price-sensitive.

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